Madras Agricultural Journal

(ORGAN OF THE M. A. S. UNION)

Vol. XXIII] MARCH 1935 [No. 3.

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Editorial.

Planning in Agriculture. The advancement of science has added materially to the comforts of the civilized man. Economic plants have been produced suited to the different regions of the world and the produce of one region can be expeditiously and economically transported to all parts of the world. In spite of the wonderful contribution by science to production, the problems of exchange and distribution have yet to be solved. If the world were ruled by reason, every country would concentrate on producing those commodities for which it is best suited and would exchange them freely for commodities best produced elsewhere. That there is a great tendency in all parts of the world to depart from these ideals is too well known. The fear of war and the consequent stoppage of imports is often a cause for a country to try to be as self-sufficient as possible with regard to her food requirements in spite of the fact that the natural conditions obtaining there might not be favourable for any particular food crop. The attempt on the part of England to grow sugar beet with the help of large Government subsidies is a noted example. The wisdom of this policy has even been questioned recently by eminent experts.

In several of the advanced countries planning in agriculture is being introduced as an empirical expedient not only dictated by circumstances but as a deliberate scheme of economic and social reconstruction as well. Theoretically planning in agriculture may

seem a simple affair involving only the adjustment of supply to demand or the production of commodities so as to just meet the demands of the market. Where supply and demand do not balance, the equilibrium is brought about either by reducing the supply or increasing the demand. There are however ever so many practical difficulties in the execution of the planning. If, what is stated, that the farmers who are scattered and also individualistic in outlook cannot easily organise and combine with a view to achieve a certain unity of control over their production and marketing facilities, is true of the west, one can easily imagine the possiblities of planning when applied to India. Agriculture as compared to other Industries is severely handicapped during these days of depression because of its inherent inability to adapt its production to changing conditions of the market. In other industries and trades balance between supply and demand is often brought about by the elimination of small producers. In Agriculture, however, great bulk of producers consists of small farmers and the question of elimination does not come in at all. Agriculture is their occupation and provides them with their minimum food requirements. The inadaptability of agricultural industry to the changing conditions has been the main reason for its being hit hard during the days of depression. The farmer not only loses part of his income by the fall in the price of the produce but he is obliged also to pay relatively higher prices for the products of other industries which he has to buy for his farm and household. The affected countries usually try to improve the price situation of their products on the markets, by setting up systems of protection against foreign competition. By the imposition of heavy duties on foreign imports the price of any commodity on the local market can be maintained at such a level to make the growing of the commodity remunerative. This is what was actually done by countries like Germany, France and Italy to protect their home grown wheat. Even England which has all along remained a free trading country has had to adopt protection to improve the economic position of her farmers. All these actions notwithstanding, due to the all-round depression and the decline of the purchasing capacity of the consumers, further drop in the prices of the commodity could not be prevented. So in addition to protection, other expedients had to be thought of. These consisted of marketing schemes, pooling arrangements, cheap credit, moratoria and other arrangements to relieve the burden of debt, subsidies in different forms, etc.

Since in agriculture unlike other industries so large a part of the aggregate output of any commodity is contributed by small unorganised producers working with very little capital, all the pioneering work in any planning has to be done by the Governments concerned. Private enterprise can do very little in the matter. It is obvious that even Governments should find it extremely difficult to control the production of commodities grown on a large scale in particular areas.

The attempt being made in Bengal to restrict jute output is an example. To successfully carry out a scheme of reduction involving a mass of producers there should be offered certain direct economic incentives and this should apply only to such branches of production as have definitely outgrown the capacity of the existing markets. The action taken by Japanese Government with regard to her rice production might be of interest. Due to increasing pressure of supplies of rice in the country during 1933–34 the Government was faced with the difficulty of maintaining prices. She immediately controlled the supplies even from her own colonies, Korea, and Formosa, and decided to reduce the rice area of the country by 10% for the 1934—35 season. A large quantity of 1933—34 season's crop was purchased by Government and assistance was given for storage of old-crop stocks. Quantities of foreign rice were also re-exported ; some of the Burma rice was actually sent back to Bombay market.

Where the planning is concerned with the production and marketing of an important commodity, if it should be effective, it will have to extend beyond the national frontiers. No success can probably be achieved with regard to the great agricultural staples without recourse to concerted international action. The recent wheat agreement entered into by the chief wheat producing countries is an example. This applies also to an industrial commodity like rubber and the rubber restriction scheme covers practically every country of the world.

In India the economic depression has greatly affected the prices of agricultural produce, particularly the staples—rice and wheat, in recent years. The situation has remained grave since some time. Though it was first considered by some that the depression was only a passing phase, it has persisted and the very recent signs of a small improvement in the case of rice in South India is not the result of any action taken to improve prices but rather due to the decrease in the usual production in the country as a result of adverse weather conditions. The growers have been agitating for the last two years and pressing the Government to take some action to raise the price levels of the produce and thus relieve their distress. Realising the heroic attempts made by all other advanced countries to improve the position of their farmers, Government of India also felt that they too must try and do something. Suggestions had been made both by politicians and commercial magnates that the alteration of the exchange ratio and increasing the currency would bring relief. The Government of India, however, did not take any action as they found it impossible to proceed on those lines. The question of rural indebtedness was discussed at a Provincial Economic Conference which met in Delhi early in 1934 and some of the provincial representatives had suggested that possibly some relief might be obtained by crop planning. It was considered that certain commodities were on one

hand insufficiently produced and certain others overproduced necessitating a readjustment of production. It was also felt that India might try and take full advantage of the Ottawa preferences by sending special commodities to the British market.

The Government of India summoned therefore a Crop Planning Conference last June in Simla to see what steps might be taken to coordinate a plan of agricultural production for India as a whole. Every province was represented at the conference by their Directors of Agriculture, Land Revenue Officers and a few non-officials. The conference which met for two days considered the following issues with reference to rice, wheat, cotton, jute, oil-seeds, sugar, tobacco etc.

1. Whether there was an over production (a) in the principal producing areas and (b) in India as a whole;

2. If there was over-production what steps were necessary to deal with the problem (a) by way of restriction and (b) by way of development of the markets;

3. Is the creation of some organisation necessary for the purpose of improving and developing the cultivation and marketing of the crop discussed.

The proceedings of the Conference have already appeared in the papers. The Conference after expert scrutiny of the figures available came to the conclusion that there was no over-production of any crop except that of jute which concerned the province of Bengal only. The Conference was in the opinion of some, a failure in that it did not make any recommendation to enable the agricultural produce of the country to become more remunerative than before. Obviously the Conference could not do any such thing because the problems before the Conference were too complicated to admit of easy solutions.

Taking for example, the case of rice in our Province, even granting that there was over production (it was actually proved at the Conference that it was not so) what is it that might be grown in place of rice? The conditions of rice growing in Madras vary so greatly and the possibility of replacing rice by other crops appears to be very limited indeed. The chief difficulties in the case of the deltas where rice areas are concentrated are the want of adequate drainage facilities and the availability of water for a sufficiently long period in the year. The one crop for which probably there is still scope for increasing the area under it is sugarcane. The successful extension of this crop in the deltas demands research on two definite lines. One is to evolve varieties of rice and cane which can be grown with the least amount of water and the other to evolve canes which can withstand water-logging for places lacking drainage facilities. The breeding work in these two crops has already shown the possibilities of achieving results in these directions. The areas under rice cultivated by lift irrigation in parts of South and North Arcot, Chittoor, Chinglepet

and Salem districts would appear to give the greatest scope for replacing rice by other industrial crops. There are signs in evidence that a change is slowly coming over in these parts. The area under cane has considerably increased in every one of these districts within the last three or four years. It is as well to remember in this connection some of the difficulties in the extension of the area under cane. They are the limited size of the majority of holdings, their scattered nature, the general poverty of the average farmer, and the lack of suitable facilities to convert the cane into either sugar or jaggery.

The areas to come under new irrigation projects would appear to offer the greatest scope for definite crop planning if they are well thought out before commencement. As Mr. Ramamurthy, our Director of Agriculture, has pointed out on several occasions, the Agricultural Department has been hitherto following the lead given by the Irrigation Department in the designing of all new schemes of irrigation but now the time is come when the Agricultural Department which has accumulated enough information should be able to give useful suggestions to the Irrigation Department with regard to what crops could be grown, when the irrigations will be necessary, etc., before definite schemes are launched. This obviously necessitates the closest co-operation possible between the two Departments.

Unlike other countries we have fortunately a big internal market for most of our agricultural produce, the possibilities of some of which have yet to be explored. The great disparity in prices obtaining in different parts of the country leaves ample room for better distribution of the produce. Naturally we have to consider the question of transport charges in this connection. This point was considered by the Crop Planning Conference and an undertaking was given by the representatives of the Railway Board present at the Conference that where special rates were required to facilitate particular movements of special crops, the question would receive their sympathetic consideration. We are glad that the Railway Board has also promised to consult Agricultural Officers and the new marketing staff in connection with such proposals.

In any scheme of planning we should have definite data as to the total production of particular commodities in any given area, whether they are wholly consumed in the tract or partly exported, and if exported, the nature of markets to which the produce is sent, the cost of transport etc. A detailed enquiry of this nature has been completed with regard to rice in Madras and the new marketing staff is expected to undertake similar enquiries of every agricultural produce of the province. These enquiries when completed should give a comprehensive picture of the position of our Province with regard to her agricultural products and any changes by way of improvement could be made on the basis of this picture.

IRRIGATION FROM A RYOT'S POINT OF VIEW*

By Mr. M. K. RADHAKRISHNA IYER, B.A., B.L.,
Kulitalai.

A conference of this nature is helpful in bringing together Agricultural experience and research for a free exchange of ideas. Irrigation from a ryot's point of view is given here and research should be able to offer solution to the problems set out. Irrigation has developed considerably the world over, natural resources are utilised to the full, water is held up in times of plenty and distributed when scarce, to get over unequal rainfall distributions. But irrigation is only a means to an end and growing crops with irrigation is not enough ; it must also be remunerative, foremost.

There are about 10,000 acres of wetlands in the Kulitalai taluk irrigated by the Cauvery. Originally, the irrigation was managed by the people themselves, and was taken over by the Revenue Department by about 1882. Later in 1907, the control was transferred to the Public Works Department and continues to be so.

Prior to 1924, water was not entering the canals directly, except when the river was in floods. Water was diverted into the canals by putting up dams, known as *Korambus*, across the river with twigs, brushwood, sandbags etc. They were washed away every time by the rise of water in the river and had to be renewed.

Owing to the difficulty of constructing efficient *Korambus* and the silting up of the canals, the supply of water in the canals was inadequate and was supplemented by the drainage from the upper villages. This was done by taking water from the river to the fields through these drainage canals, which had to be maintained at a high level to command the fields. The fields were thus deprived of the valuable fertilising silt and were further encumbered with the injurious salts, passing down with the drainage. The evils of the drainage-irrigation were greatly offset by the inherent fertility of the soil and the seasonal rains, and commercial crops like sugarcane, plantains, etc. were grown largely in the taluk.

The old irrigation system was swept away by the 1924 floods and the Kattalai scheme has taken its place. There is a bed-regulator across the Cauvery at Kattalai with two high level irrigation canals, one on either side. The wet tract is now bounded by two high level irrigation canals, resulting in water-logging. Drainage is in defect and the area under commercial crops like sugarcane, plantains etc. has fallen down and even paddy does not thrive well. Expansion of irrigation without drainage has proved a big failure.

* Abstract of a paper read during the College Day and Conference in December 1934.

The annual irrigation conference of the Kulitalai taluk was held on the 9th of November 1934, under the presidency of the executive engineer. The revenue divisional officer and the ryots attended the conference. It was reiterated that the irrigation and drainage be separated wherever possible by removing the dams across the drainage canals; that the supply of water to the lands now irrigated by such canals be made from the newly excavated high level irrigation canals, and that the canals be closed for six weeks from 1st May every year, for allowing the Public Works Department to carry out repairs,—though experience would indicate the desirability of opening the canals by the middle of May itself. It may be mentioned in passing that the Agricultural Department was not invited to this conference.

Under the conditions prevailing now, single-cropped wetlands are more profitable than double-cropped wetlands, so much so that double cropped lands are sought to be converted into single-cropped lands. Two crops could not conveniently be raised owing to the closure of the canals during May and June from 1926 onwards. Landowners hold that the closure of the canals leads to the drying up of the clayey soil and lower yields, consequent probably, on the disturbances set up in the activities going on in the wet clayey soil.

The choice of crops suitable for the season is a factor that decides the profitableness of irrigation. In Kulitalai, *Kuruvai* a four months' rice crop suitable for clayey soils is sown in May-June and *Sarapalli* a three months' crop suitable for loamy soils is sown in July. Both are harvested before the onset of the N. E. Monsoon, escape submersion in the monsoon floods, and are suitable as first crops.

The incidence of Land revenue and water-tax determines chiefly the profitableness of wet cultivation. The recently revised water-rates in the Kulitalai taluk, Rs. 15 for the first crop, Rs. 7—8—0 for the second crop, and Rs. 3—12—0 for the third crop are very high. The third crop was not assessed till now. The valuation of the lands offered as security to the Kulitalai Land Mortgage Bank reveals that data given in the settlement table, based on the settlement of 1862, has no application today. The income from land is very much less than what is furnished in the table. Yet a flat rate of Rs. 15 is proposed for the first crop, irrespective of the soil, its yielding capacity and similar considerations.

The theory that the Government is entitled to half the net produce is responsible to a very large extent for the frozen credit in Agriculture. That the landowner is entitled to a share of the produce is denied in practice by this theory and the labourer and the Government more or less share the produce. The land-owner occupies a place in agriculture corresponding to that of the capitalist in industry, but is without the share that he takes as his right with the result that the land loses its value as a marketable security. The passing of the Land

Mortgage Bank Act, and the Government guaranteeing the debentures thereof, makes it imperative to invest the land with a face value, just like the guilt-edged security and that is not likely to happen till the land-owner gets a fair share of the produce as the interest on the capital invested by him on land. That emphasises the need for changing the Land Revenue Policy of the Government, and the Taxation Enquiry Committee has rightly said that "the rate of assessment should be standardised at a comparatively low figure not exceeding 25 per cent of the annual value." It is well to remember that the Sovereigns in the early days were entitled customarily to a sixth of the produce.

The dictum of law sanctified by the Privy Council, "The incidence of the ryotwari tenure is governed by custom and includes a right to receive from the owner of the soil (whether Government or a private individual) a supply of water sufficient for the irrigation of the mamool wetlands,—" does not justifiy the increased water-rates in Kulitalai. The Kattalai scheme, launched by Government at a heavy cost no doubt, must not be taken to be a commercial investment, as it is a restoration of the irrigation system that was destroyed by the 1924 floods, to fulfil the primary and customary obligations of the Government as the land-owner. The water-rate on lands newly brought under irrigation, though not governed by the above considerations, is nevertheless high, arbitrary and hence unjustifiable.

The new Mettur Dam is not only not beneficial to the Kulitalai taluk, but definitely injurious. Even in an year of poor monsoons as during 1934, the rainfall in Mercara between June and September was not in defect and would provide supply of water for irrigating Kulitalai, and the dam is not therefore any additional benefit, even protectively. The dam has prevented the inflow of fertilising silt into the fields and to that extent is injurious.

The Trichinopoly irrigation is liable to be sacrificed for the sake and benefit of Tanjore as the Cauvery irrigation is for a lakh of acres only in Trichinopoly and 9 lakhs of acres under the old system and 3 lakhs of acres under the new Mettur scheme in the Tanjore Delta. The supply of water in Kulitalai was reduced this year in September, to provide irrigation water for Tanjore and this has reduced the yields substantially, in Kulitalai.

At the present low level of prices, irrigation does not appear to pay and yield a profit. Drastic economics have to be effected all round to make irrigation and farming remunerative. Individual efforts would go a little distance only towards the solution of the problem. That is not enough; state and intervention only can relieve the present tension and save the landowners.

The fragmentation of holdings into uneconomic sizes has gone apace and consolidation of holdings by legislation is necessary. A pair

of bullocks could be maintained economically only if the cultivated area is 3 to 4 acres in double cropped wet lands and one acre in the case of baling wet lands.

Banks of irrigation canals must be made to serve as road for carting manure and seeds to the field and the produce to the thrashing floor and granary.

In Kulitalai, paddy seeds are sown at 30 to 40 madras measures (75—100 lbs.) per acre. The reduced seed-rate advocated by the Agricultural Department is not adopted for want of seed-bed areas. The Agricultural Department can select suitable areas and reserve them for nurseries.

Grant of facilities for growing green manure crops on *porombokes* and for grazing animals in the forests free of charge, would go a long way to reduce farming costs.

Revision of the Land Revenue Policy is equally necessary. There is a very great disparity between the land assessment and the income-tax. Both are ultimately taxes on income and yet there is such a difference in the rates levied on the two classes of income.

There is need for co-ordinating the activities of the Agricultural, Revenue and Public Works Departments for solving the irrigation and drainage problems. The time and period of closure of canals is an instance in point. The agricultural department is in a position to decide it best.

The pronouncement of Prof. P. J. Thomas of the Madras University would aptly close the subject. " A hundred years ago, there was a similar depression in the Madras Presidency; and it was lifted as a result of irrigation works and road-making carried out by Government.... ..a vast stimulus was given to industry and production by the employment of labour and circulation of capital. Thus of old, Madras, showed an example to the rest of India; may we hope that history will repeat itself. Financially Madras is the best equipped for initiating a forward policy just now, but the will is needed."

(Mr Ramamoorthy, I. C. S., the Director of Agriculture, partook in the discussion that followed this paper and spoke as follows.—*Ed.*)

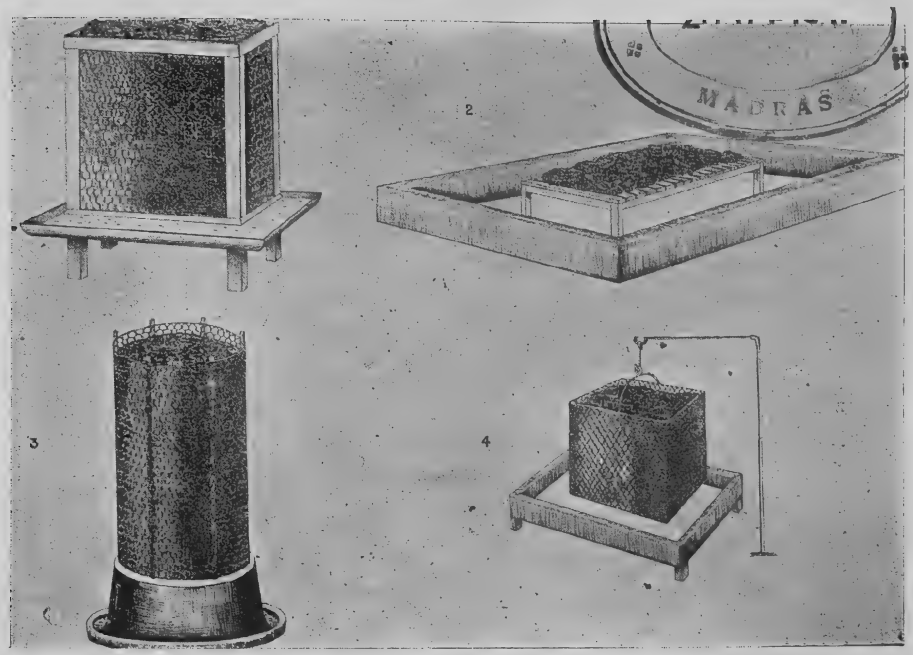
Several of the speakers referred to the necessity for the co-ordination of the Irrigation and the Agricultural Departments. Such a co-ordination has been going on for the past few years. If the Agricultural Department was not consulted in the earlier years, it was because the Agricultural Department was not in a position to give correct ideas about the water requirements of crops. Agriculture must precede irrigation and not vice-versa. But before that, experiments must be done to find out the duty of water for the various crops which would guide the Irrigation Department in the regulation

of the supply of water in the channels. It is only recently that scientific knowledge on this aspect of the question has advanced. However with the advances of knowledge on soil physics and water-relationship between the soil and the plant now, the Agricultural Department is in a position to advise the Irrigation Department, when such advise is required. As regards the other question of revenue, there have always been two views held respectively by the people who give and who take it, the former wishing to give as little as possible and the latter trying to take as much as possible. And this has led to differences between the two. As regards the water-rate, it was fixed at a time when times were prosperous. Everyone has been hit hard by the present depression and there is no use crying against each other.

THE HOUSEFLY NUISANCE AND ITS CONTROL WITH MAGGOT TRAPS.

By T. V. RAMAKRISHNA IYER, B.A., Ph. D. F. Z. S.

Man and the Housefly: It is well known that the common housefly is one of the worst pests of our dwellings and that, during certain seasons in the year, this creature becomes a terrible nuisance. Though for all appearance this dark grey flying insect looks an innocent and harmless creature and is unable to cause pain like the mosquito its potentialities for mischief are formidable; for, it is not only a mechanical nuisance flying about the nooks and corners of our dwellings, visiting both filthy and wholesome materials and contaminating the latter, but it has also gained great notoriety as a terrible disease carrying agent. Infectious and dangerous diseases like Cholera, Tuberculosis, Typhoid and Dysentery are easily carried by the fly from those suffering from these diseases to healthy persons. The general features of the body of the fly are specially suitable for performing its functions very effectively; for it has its legs, body, wings and the mouth parts well supplied with hairs and bristles which serve as excellent media for carrying infective particles. Infection is mainly caused by the direct contact of the different parts of the body which carry germs of disease with wholesome food, drinks, etc., when the fly perches on the latter; the fly has also the habit of depositing its excretory particles, foeces 'specks' which may contain highly infectious germs in great numbers. In its habits, therefore, this fly is disgustingly filthy, feeding indiscriminately on excrement of all kinds such as vomit, sputum, nasal and eye discharges, pus and blood from boils and wounds; in the same manner, it is equally attracted by all the best and tasteful of human food stuffs and will, when not disturbed, pass to and back between the two extremes. It is, therefore, incumbent on every householder and citizen and on every person responsible for the general sanitation and health of our villages and inhabitants that sufficient attention is paid to this terrible pest.



SOME TYPES OF FLY MAGGOT TRAPS

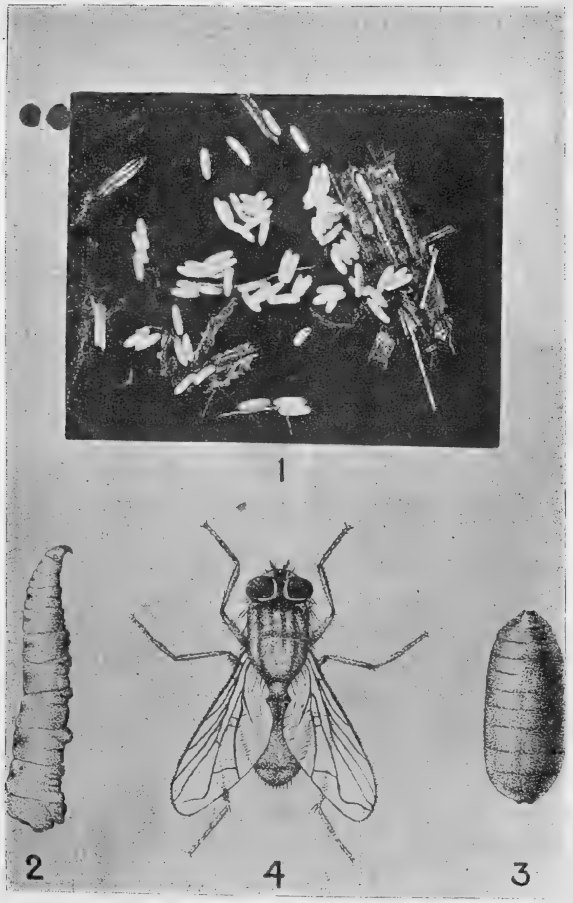
Fig. 1 The Farm Model. This is a rectangular wooden frame work standing on four legs enclosed by ½'' wire netting all round and open above. All round the base of this wire walled compartment is a sloping plank leading into a V—shaped drain of galvanised iron containing water. Manure to attract flies is dumped into the wire gauzed enclosure and the mature maggots in their attempts to migrate away from moisture come out of the manure heap through the meshes of the wire gauze and drop into the channel below through the sloping plank.

Fig. 2. This is the model used in American farms. It is a grated wooden platform on short legs placed in the middle of a vat or basin of water ; the manure is heaped on the platform and the maggots wandering away from the moist heap drop into the water and get drowned.

Fig. 3. A wire gauze frame over an inverted water tub ; here the inverted lip of the tub serves as the water channel to trap the maggots when they escape from the wire gauzed enclosure inside which manure is heaped. This enclosure is made of split bamboo bits attached to the sides of the tub. This is the one used at Anakapalle.

Fig. 4. This is a wire gauze basket to hold the manure hanging over a water basin. While Nos. 3 and 4 are small and cheap models which would be found convenient for households, Nos. 1 and 2 will be found suitable for large farms and cattle depots.

The main principles are same in all these.



1. Eggs. 2. Maggot. 3. Pupa. 4. Adult.

HOUSE FLY

The Fly and its Life-history: It will help us to know something of the life-history and habits of the fly before we adopt measures of control. The fly is a greyish dark active creature with two wings and measures about $\frac{1}{4}''$ in length. There are numerous species of the housefly in different parts of the world showing differences in coloration and slight variations in appearance, but in general life habits, all these are similar. The life history of the housefly just like that of a butterfly, beetle, moth or wasp shows four stages—the egg, the maggot, the pupa and the fly; it is only this last flying stage with which most laymen are familiar. The life story of the fly is like this. The female fly lays numerous cream white eggs in batches of hundred or more generally on horse and cattle manure and all kinds of decaying animal and vegetable matter. These eggs hatch into small worm-like larvae called 'maggots' and the period taken to hatch depends a good deal on the weather, the hatching being quicker during damp hot weather and retarded during dry cold months. Generally, in about 30 to 40 hours the eggs hatch; the maggots feed on the manure or excretion on which they were born and grow into yellowish white cylindrical maggots measuring about $\frac{1}{8}$ to $\frac{1}{2}$ an inch. In about 4 or 5 days they become full fed and hasten to change into the next stage—the pupa; before changing into the pupa the full fed maggots have the habit of crawling away from their moist surroundings towards drier parts of the manure heap, the soil around, under stones, etc., and then change into the brownish seed like pupa (fig.). It remains in this stationary stage generally for two to four or five days according to the temperature of the environment. Generally it takes about 12 to 15 days for one life cycle from egg to adult. Bright sunny weather stimulates their breeding habits and cold dry weather retards the same. In every uncared for manure pit and rubbish heap one can easily come across millions of fly maggots revelling in the midst of their inexhaustible food material and preparing to emerge as prospective members of the numberless swarms of flies hovering about such insanitary situations in our villages and towns.

Fly control with maggot traps: The most effective and radical measure to get rid of the housefly nuisance or at least to minimise its mischief is based on a knowledge of its life history and habits and this is to prevent its breeding and rapid multiplication; for this, one has to tackle the breeding grounds of the creature. The defective disposal of night soil, and of town and village rubbish, is the main cause of the housefly nuisance in every place. The remedial measures for such a state of affairs are of course, in the hands of health officers and sanitary inspectors. But, in small farms and households, other methods will also give some relief. These measures include the use of traps of different kinds to attract and kill the pest. Usually, these consist of fly papers, poisoned baits and other mechanical devices;

these are measures only against the adult flies. There is, however, another method in vogue in some western countries which is aimed at the destruction not of the fly but that of the developing maggots and the devices adopted for this are called 'maggot traps.' These are constructed with the idea of entrapping and destroying the maggots in the manure and thus prevent their pupation and reaching the adult condition. The main underlying principle on which these traps depend is the fact that mature fly maggots, before they pupate, exhibit a negative hydrotropism—that is, they migrate away from their moist surroundings and seek dry corners for pupation ; this habit is taken advantage of and utilised in the control. Every such maggot trap is constructed with a sufficient supply of food material of the proper consistency to attract flies to lay eggs and allow the larvae hatching out of these eggs to grow into full fed maggots, and at this stage, to trap and drive them to destruction. The chief requisites of such a trap are – first, an open platform or enclosure to store an attractive heap of moist manure or garbage to tempt the flies which freely lay eggs on it giving rise to active maggots and, secondly, an arrangement around this platform to trap the full grown maggots to a watery grave before pupation. With these two essential provisions a maggot trap can be made of any dimensions and of any quality and cost. In the case of big farms, dairies, stables, etc , where there is an enormous accumulation of manure every day, fairly large and strongly constructed traps will be found effective and economic in the long run. For small households, etc., cheap ones can be made. The type of trap (Fig. 2) used in some parts of America consists of a grated wooden platform on short legs placed over a cemented basin or vat of water. The manure to trap the flies is heaped on the platform and kept thoroughly moist. The mature maggots in the heap, driven by negative hydrotropism, migrate away from the moist heap to pupate and, in doing so, drop into the water below and get drowned. The size of the vat and that of the manure dumping platform will depend upon the needs of the particular farm or household and the cost of course will vary accordingly. The following are some of the models suggested as maggot traps.

Farm model. Fig. 1. *Tray & platform.* Fig. 2. *Inverted water tub.* Fig. 3. *Hanging wire basket.* Fig. 4.

The important points to be attended to in this connection are that the manure in the trap must be never allowed to get dry and it should be renewed once in four or five days ; the former is to prevent the maggots pupating in the heap and the latter to supply fresh food material for flies to breed satisfactorily.

Every householder can easily set up such a trap in fly infested localities and help in minimising the fly nuisance.

INTRODUCTION OF IMPROVED *RAGI* (*ELEUSINE CORACANA*) STRAINS IN CHITTOOR AND N. ARCOT DISTRICTS

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Introduction. In the Season and Crop Report for 1932-33, the area under *ragi* was as shown below :—

District.	Irrigated.	Rainfed.
Chittoor	57,981 acres	106,538 acres.
N. Arcot	71,213 ,,	27,348 ,,

The various districts of the Presidency arranged according to the area under irrigated ragi are Vizagapatam, which with its 119,655, acres tops the list, followed by Coimbatore, Anantapur, Nellore, N. Arcot, Cuddapah, S. Arcot, Chittoor, Chingleput, Madura, Ramnad, Trichinopoly, Salem, Ganjam, Tinnevelly, Kurnool and Tanjore. According to the above N. Arcot holds the fifth and Chittoor the eighth place in the Presidency.

The various districts of the Presidency arranged according to the area under rainfed ragi are Vizagapatam with its 387,997, acres which tops the list followed by Salem, Ganjam, Chittoor, Coimbatore, Trichinopoly, Ramnad, E. Godavari, N. Arcot, S. Arcot, Anantapur, Chingleput, Bellary, Madura, Malabar, Tanjore and Guntur. According to the above list, Chittoor holds the fourth and N. Arcot the ninth place in the Presidency.

2. **Cultivating seasons.** Irrigated ragi is sown in two seasons, viz., December—February and May—July. Rainfed ragi is sown in July—September.

3. **Varieties grown.** The following are the varieties grown :—

a) Irrigated. (i) N. Arcot—*Karun suruttai, Vellai suruttai, Kulla ragi, Vella pandian.*

(ii) Chittoor— *Kudumu ragi, Mutta ragi, Tella gidda ragi, Nalla gidda ragi,* and *Addiga ragi.*

(b) Rainfed

(i) N. Arcot— *Perun kevuru, and Karun Suruttai.*

(ii) Chittoor— *Pedda ragi and Gidda ragi.*

The average yield of the local irrigated ragi is about 2000 lb. per acre, while that of the local rainfed ragi is about 700 lb. per acre.

4. **Introduction of improved strains.** E. C. 593, an improved irrigated ragi strain evolved at the Millets Breeding Station, Coimbatore, was tried in January 1933, in each central village in both the districts. The stand and yield of the introduced strain impressed the ryots in all the places wherever it was tried. During May—July sowing

in 1933 there was a great demand for the seed. In December '33—February '34 sowing season the area under the strain increased in each village and so also in May—July season of 1934. The strain has already commenced to have a natural spread and it has a very bright future in both the districts. The following figures reveal the superiority of the strain :—

Taluk.	Yield of local (in lbs. per acre)	Yield of strain E. C. 593 (in lbs. per acre)	Difference in lbs. in favour of strain.
(i) Wallajah	2120	2400	280
	1874	2385	511
	1985	2300	315
	2025	2200	175
	1975	2400	425
(ii) Palamaner	1890	2240	350
(iii) Gudiyattam	3060	3882	822
(iv) Chittoor	1636	1900	264
	1925	2139	214
(v) Tirupattur	2750	3750	1000
(vi) Cheyyar	1860	2700	840
(vii) Tiruttani	1612	2454	842
	24,712	30,750	6,038
Average	2059	2564	503

Increase in favour of strain is 24·4 per cent.

The strain is liked for the increased yield of both grain and straw. It does better than the local varieties in both the growing seasons and more particularly in December—February planting season.

5, **Conclusion**. A suitable strain to replace the local irrigated ragi strains has been found. It has appealed to the ryot in spite of its defects viz , a delay of 10 to 15 days to come to harvest and requiring two more irrigations when compared with the local strains, the increase in yield more than compensating these defects. The writer has seen a few cases where the strain had a stand of about five feet in well manured fields. In the case of rainfed ragi, trials are under progress with H—22, an improved strain evolved by the Mysore Agricultural Department and which is extensively grown in Mysore territory bordering Palamaner and Madanapalli taluk, of Chittoor district.

A SHORT NOTE ON TOBACCO DECOCTION AS AN ECONOMIC SPRAY MATERIAL FOR PADDY THRIPS

By T. V. SUBRAHMANIA AYYAR, B.A.,
and K. P. ANANTANARAYANAN, B.A. (Hons.)

Among the various kinds of insect pests that the paddy crop is subjected to in the early stages of its growth—Thrips—known scientifically as *Thrips oryzae*, Williams, though probably the smallest in size, among the pests of paddy, is by no means insignificant from the point of view of the damage it is capable of doing. Under certain conditions

of weather the pest multiplies itself in large numbers and causes very serious injury to paddy seedlings, the damage manifesting itself in the rolled up needle-like leaves of the plants and rather parched up appearance of the whole seed bed ; in extreme cases the damage is so complete that the whole seed bed is destroyed and fresh seedlings have to be raised for transplantation. In Coimbatore the attack limits the area that can be planted with the seedlings and therefore the insect deserves more than ordinary attention. Since the attack is confined to seed beds which are small and compact the insect can however be easily tackled.

This pest has been noted in serious pest form in several paddy tracts of this Presidency, viz., Coimbatore, Malabar, Tanjore and Chingleput. Some useful information about this pest is contained in Bulletin No. 25 of the Madras Agricultural Department and in the article "Bionomics of Thrips injurious to plants in S. India" (Agriculture, & Live Stock in India, 1932).

In July 1934, a number of varieties of paddy was sown at the Paddy Breeding Station, Coimbatore, in fields under irrigation channels. There were light showers of rain during the first week after sowing and no rains for the next fifteen days. When the seedlings were nearly 22 days old the presence of numerous rolled up leaves and a general scorched up appearance revealed an attack of thrips. Counts of the population of thrips were taken to find out the severity of the attack. About 30 plants were pulled out at random from the badly infested plots and these on examination yielded 97 adults and 541 nymphs giving an average population of 3·2 adults and 18 nymphs per plant.

The neighbouring plots that were more or less free were being invaded by the increasing population of the insect. It was found that seedlings that were comparatively older and as well as seedlings of varieties with broader and thicker leaves were practically free from damage though in the middle of the infected area.

As the seedlings were more than 10 inches high, and as the nursery beds themselves were on a slightly raised level, flooding the fields to drown the seedlings with the thrips was not practicable. Hence, spraying the plants with dilute tobacco decoction was resorted to. For the whole area of about an acre five pounds of tobacco was soaked in 5 gallons of water for 24 hours and the liquid after staining was diluted at the rate of 1 to 6 with water. Immediately after spraying a large number of insects was found to be dislodged from the plants and falling into the water dead or dying. The plants were examined about two hours after spraying and counts taken as before for the average population per plant.

For 30 plants there were 3 dead adults, no living ones, 134 live nymphs and 159 dead or dying nymphs, giving an average of no living

adult, 0·1 dead adult, 4·5 living nymphs and 5·3 dead or dying nymphs per plant. The population per plant was thus very much lower than before spraying; and even those insects that were alive were found gathered at the top of the curled leaves where the tobacco decoction could not probably reach.

The effect of the spraying was remarkable when the crop was examined again after 3 days when there were 6 living adults, 27 dead adults, 10 live nymphs and 67 dead nymphs for 30 plants giving an average of 0·2 living adults, 1 dead adult, 0·3 living nymphs and 2 dead nymphs per plant. The presence of more adults now may be due to the fact that they might have come in from untreated plots nearby or the ones found to be dying during the previous count may have recovered or some of the grown up nymphs might have moulted and become adults. While the total living population of thrips for 30 plants was 638 before spraying it was only 16 three days after spraying, thus giving a mortality of 97%.

For a total area of 1 acre of seedlings, 5 lbs. of tobacco was used at a cost of 5 annas at 1 anna per pound, and three coolies worked for a day costing 15 annas at 5 annas per head per day. Thus, the total cost of the operation comes to Rs. 1—4—0. If boys could be engaged for the work the cost would be 6 annas less, i.e., only Re. 0—14—0 per acre. Considering that it costs only 14 annas to treat an acre of seedlings the seeds from which could be transplanted over 13 acres the normal yield from which may be 39,000 pounds of paddy worth Rs. 1200 even in these days of depression and considering the efficacy of the treatment, spraying tobacco decoction may be considered to be one of the best ways of controlling thrips in paddy seed beds. And this method can be specially recommended in areas where water is not easily available to check the pest by flooding the nurseries.

The authors are thankful to the Paddy Specialist for having afforded facilities for conducting their trials at the Paddy Breeding Station.

AN ECONOMIC ENQUIRY OF THE CULTIVATION OF PLANTAINS IN THE ERODE TALUK

BY N. GANESHAMURTHY, B. Sc. (Ag.)

Plantain is an important crop grown in the wetlands of the Erode Taluk, ranking next to paddy. The following table gives the acreage of the wetland-crops here for the year ending June 1933.

Crop.	Acreage in 1933.	Normal acreage.	Difference in acres.
Paddy	19,324	18,055	+1269
Plantains	1,782	864	+ 918
Sugarcane	509	634	- 125

It may be seen that the area under plantains has nearly doubled and with the present slump in the paddy market continuing and with

the relatively better prices for plantains, the area under plantains is likely to increase.

Soil. The wet-land soil of this tract is a sandy loam, well drained and the depth of the soil varies from 4 to 4½ feet. Years of manuring and cultivation have made the soils very fertile. The rich silt brought down with the irrigation water has also contributed to raise the fertility of the soil.

Varieties. The important varieties of plantains grown here are the *Monthan*, *Poovan*, *Rasthali* and *Pachainadan*. *Monthan* occupies nearly 50 per cent. of the area, the rest occupying nearly 35, 10 and 5 per cent. respectively.

Season. The suckers are planted in June—July, September or November. The November planting is considered to be the best, since the period from flowering to harvest is free from heavy winds. The mature crop of the other season plantings are often caught in the heavy westerly winds and serious loss of bunches results.

Preparatory Cultivation. After the harvest of the previous paddy crop, pits 1′ × 1′ × 1′ are dug 8 feet apart between the rows and 7½ feet apart along the rows, 726 suckers going to an acre. Well developed suckers 5 to 6 months old are selected from the standing crops in the neighbourhood and are planted in the pits. The soil round the suckers is rammed well 3 days after planting, to stimulate fresh root development.

After Cultivation. After the planting is over, the area is worked with *mamooty* and one or two ploughings are also given. Within four days of planting, trenches are dug in between alternate rows to a depth of nearly a foot, both along and across the field to enclose four plants in each bed or plot. These trenches serve both for drainage and irrigation.

If the field is water-logged and not easily drained, the trenches are deepened in the second month and again in the third or fourth month, the final depth being 3 to 3½ feet. The beds are *mamooty*-hoed at intervals of 3 weeks and the plants are earthed up. On the whole 12 diggings are done.

Manures and manuring. Manure is applied about two months after planting, usually after the second digging and the manure most in favour is ground-nut cake, applied at the rate of 2½ lbs. of the powdered cake per plant. Sometimes municipal rubbish and farm yard manure are applied. Excess of manuring is avoided for plantains as it stimulates many side-shoots detrimental to the main crop.

Irrigation. The plantain crop requires a large quantity of water and in this tract about 20 irrigations are given, about once a fortnight. Water is allowed to stand in the trenches for a day to a depth of nearly 6 inches and then drained off. Since the source of irrigation is the

Kalingarayan channel which is closed during April and May, the crop is not irrigated these two months and the crop is entirely dependant on summer showers amounting to about 4 inches.

Removal of Side-shoots. Along with the main shoot, eyes from the planted bulb develop and compete with the main crop. They are cut close to the point of attachment with the main bulb and removed. This is done to maintain and develop the vigour of the main stock.

Maturity and Harvest. From the ninth month onwards from planting, the crop puts forth bunches which develop in 3 to 5 months, depending on the variety. The plants mature early, if the summer is unusually hot and dry. If the crop is in bunches when the westerly winds are strong, the plants are propped with bamboos.

The Plantation. When the standing crop is in bearing two side shoots that develop at that stage are allowed to grow for succeeding the mother-plant after it is removed. Sometimes one plant may be retained and the rest removed to plant new areas. Some ryots keep two suckers, gather leaves regularly from one of them, the other being allowed to develop for the bunch. The plantain is maintained for nearly three years, and 3 crops of bunches are gathered, leaves alone being harvested from the plantation after the harvest of the third bunch crop.

After the harvest of the bunch, the mother-plant is cut leaving five feet of the stem in the ground. After the sucker starts vigorous growth, the stem is cut back farther leaving about a foot in the ground.

The other cultural operations for the second and third generation of plants is the same as for the first generation.

The cost of cultivation of plantains in two holdings at Surampati village in Erode Taluk are given below. *Poovan* plantains were grown in both the holdings, for 3 years from 1931. Each holding had a permanent cooly at Rs. 3 - 0—0 a month, for guiding water and watching the crop. Additional labour was hired on contract whenever necessary. Bullocks were not maintained by either.

Holding A is 1½ acres in extent and is cultivated by Mr. Subbanna Goundan and holding B is 2½ acres and cultivated by Mr. Kandasamia Pillai.

Cost of cultivating plantains in the two holdings reduced to an acre in each case, for 3 years that the plantation was maintained.

	Holding A. Rs. As. Ps.	Holding B. Rs. As. Ps.
1. Ploughing once and digging pits 1′ deep, in the first year	7—5—4	8—0—0
2. Suckers bought at Rs. 20—0—0 per 1,000 ...	13—5—4	14—6—5
3. Charges for collecting suckers from various gardens, carrying and planting them at Rs. 0—12—0 per 100 ...	5—0—0	5—6—5
4. Fencing in the first year	12—0—0	10—0—0
5. Trenching in the first year at Rs. 20—0—0 per acre, on contract	20—0—0	20—0—0

6.	Deepening the trenches in the second and third year	3—5—4	4—0—0
7.	Digging with *mamooties* and earthing up, spent every year	120—0—0	138—0—0
8	Cost of ground-nut cake, 2 barams an acre a year for 3 years, at Rs. 13—0—0 a baram of 1,000 lbs. ...	78—0—0	78—0—0
9.	Applying the groundnut cake	4—0—0	3—9—7
10.	Guiding water and removing suckers by a man at Rs. 3-0-0 a month, with a little extra labour at times	73—2—0	43—3—2
11.	Bamboos for propping, purchased in the first year; 1/6th the number of plants being propped in holding A and 1/4th the No. in B	10—0—0	20—0—0
12.	Harvesting the bunches and taking them to the owner's house 1½ miles off, at Rs. 0—1—6 a bunch ...	178—2—0	191—4—0
13.	Land revenue for 3 years	36-12—0	37—8—0
14.	Interest for 3 years on the value of the land at Rs. 3 per cent.—Value of land at Rs. 1,500—0—0 an acre ...	135—0—0	135—0—0
	Total expenditure in 3 years ...	696—0—0	708—5—7
	Receipts.		
1.	By sale of bunches at Rs. 0—8—0 each, in 3 years ...	950—0—0	1,020—0—0
2.	By sale of suckers, at Rs. 20-0-0 per 1,000, in 3 years	20—0—0	36—0—0
	Total receipts in 3 years ...	970—0—0	1,056—0—0
	Net receipts—total receipts minus expenditure for 3 years	274—0—0	347-10—5
	Net receipts in an year—i.e. income from an acre a year	91—5—4	115-14—2

[*Note*:—The income from the two holdings under the plaintains are Rs. 91 and 116 respectively, and compare favourably with what is obtainable by cultivating Paddy. The holding A had 666 plants to the acre and the holding B had 720 plants to the acre, and the difference of Rs. 25 between the incomes of the two holdings is clearly due to the difference in the number of bunches obtained. The cultivation operations and their cost are more or less the same for both the holdings. Both had a man on Rs. 3—0—0 a month for guiding water and watching the crop and the cost of his maintenance is distributed over 1½ acres in A and 2½ acres in B. which has increased the cost of cultivation in A by nearly Rs 10—0—0 a year, per acre. This incidentally indicates the desirability of having economic-sized holdings with reference to the manual and cattle labour on the farm. For the one-man farm under plantains, 2½ acres would appear to be nearer the economic limit. So small factors in farming, like the number of plants in an area, or the number of men or pairs on the land, which may not be apparent always, operate and lead to failure or success in farming.

Such enquiries are very helpful in locating the weak spots in the cultivation programmes, which ultimately lead to failure. In the present case, the charges for harvesting and carrying the bunches to the ryot's house would appear to be enormous and economy on this item of expenditure is clearly indicated.

Plantains are cultivated at a heavy cost requiring an investment of Rs. 240—0—0 an acre a year, which stands in the way of expansion of cultivation of the crop. Further, the plantain bunch is a perishable product and wholesale expansion of the area under plantains is not likely or possible. Nevertheless, a certain amount of expansion would be stimulated by quicker transport facilities to the North Indian markets at economic rates. Cold storage facilities and researches on packing methods would improve the keeping quality of the fruit. All these would help to enlarge the market for the fruit and the area under the crop would automatically keep pace with the increased demand.—V. T. S.]

Correspondence.

Indebtedness of the Agriculturists.

Rao Bahadur K. S. Venkatarama Ayyar, writes from Negapatam.

Dewan Bahadur M. Ramachandra Rao in his presidential address at the Agricultural College Day and Conference held at Coimbatore in December last drew pointed attention to the economic and agricultural depression throughout the world. He also rightly pointed out how India which has been most affected had not taken any measures worth the name when other countries had taken special steps to protect the primary producers. The Presidency of Madras especially south and east Madras which grow rice is most affected and the continued import of rice from Siam has cast a gloom over the South Indian producers. Notwithstanding the representations of the ryots and the local Government, the Government of India do not seem to have realised the gravity of the situation and steps have not been taken to prevent further dumping. The Local Government have appointed a Marketing Officer who is now touring the districts and his report is awaited. They have also appointed Mr. Satyanandhan to report on the indebtedness of the agriculturists and have even suggested the questionnaire. That the ryots especially the rice producers are almost all of them indebted is a fact too well known to need an investigation, and before Government can take action on the report, much of the lands would have found their way into the hands of the money-lenders. As pointed out in the Editorial of the 1934 November issue of the Madras Agricultural Journal, the money-lender becomes the owner who is often an absentee landlord who has to lease out the lands for cultivation and the cultivator becomes indifferent in the hands of the tenant. There are no two opinions regarding the desirability of the owner cultivating the lands himself, or at least under his own supervision; otherwise intensive cultivation and agricultural progress are impossible. Some provinces in North India have taken the necessary steps to avoid the lands passing away into the hands of money-lenders and to provide easy means of repayment spread over several years with low interest, at the same time guaranteeing payment to the creditor.

With the latter end in view, the Madras Government passed the "Madras Co-operative Land Mortgage Banks Act of 1934" and the Central Land Mortgage Bank which is intended to finance the primary banks in the various districts has large funds at its disposal, but the restrictions imposed on the grant of loans and the high rate of interest charged stand in the way of the successful working of the banks and the real agriculturist who needs help cannot get it. For example the highest amount which the banks can lend to an individual is Rs. 5000/- and the gross liabilities of the borrower inclusive of his prior debts should not exceed Rs. 5000/-. Why should there be this restriction? Due to this restriction, the big landholder as for e. g., one who pays an assessment of Rs. 500 and above, is handicapped and cannot look to the Central Land Mortgage Bank, to advance him money to the full extent of his credit. The banks of course should assure themselves that the security against the loan is proper and sufficient. It may safely be assumed that the value of the land is 30 times the assessment or even less and the loan to the extent of 75% of the estimated value can easily be sanctioned. At the same time there need be no limit to the amount of the loan, though for the present the limit may be fixed at Rs. 20,000. I have myself been conducting a permanent fund at Negapatam where (when I was in charge) there was no necessity to go to court for the recovery of the mortgage debt. When

funds, which recover their loans in 45 monthly payments, found no difficulty to get back the loans, why should primary banks which grant several years for repayment be tied down by unworkable rules? The rules may be relaxed with proper safeguards. For example, in the case of loans for over Rs. 10,000, the Deputy Registrar's sanction may be obtained and the Directors (if they are honest and respectable men) can easily be trusted in the matter of grant to particular applicants. The respectability, antecedents and the thrifty character of the borrower may be well known to local officers and non-officials who may if necessary be consulted. The restrictions imposed on borrowers not only causes hardship to deserving men but also leads the less scrupulous to resort to fraud. There are cases of respectable landholders who had large assets in the shape of mortgage-debts, who were obliged to accept and swell their lands in lieu of the debts due to them and who by circumstances over which they had no control in turn have become debtors to the extent of more than Rs. 5,000. The borrower sometimes in order to obtain the sanction of a loan gets over the difficulty by ingeniously manipulating his loans over Rs. 5,000 by temporary adjustments, and presents a seemingly true statement to the effect that the liabilities do not exceed Rs. 5,000. In such cases, repayments will not be regular and such loans may have to be recovered after recourse to coercive processes. Most of the Primary Banks will fail on account of restrictions imposed which are either unworkable or avoided by fraud. I have known cases in which the Secretaries and Directors canvas for taking loans from the primary banks to show that the Banks are availed of by the landholders; but such banks in the course of some years get into difficulties. I have spoken to Dewan Bahadur M. Ramachandra Rao, President of the Land Mortgage Bank about the modification of the present rules and I hope that he will make the banks more useful as I learn from him that there are large funds accumulating in the banks, lying idle.

Another way in which Government can help the agriculturists is to undertake payment to the creditor by instalments with interest at about 5% and recover the amounts from debtors at 6%, one per cent. being sufficient to cover the expenses of Government in working the scheme for relief to the agriculturists. Several European countries and Australia have come forward through their Governments to relieve the pressure of the creditors, at the same time guaranteeing payment to the mortgagees and have enabled debtors to continue the ownership of the lands. The money-lender does not want the land and does not want to become an agriculturist and he will gladly agree to take the money back with less interest when guaranteed by Government and allow the landholder to be in possession, as Government will prevent any alienation of the land till the loan is repaid.

There is no use of delay in finding out a solution and speedier active steps are needed to save the agriculturist from ruin.

Review.

Termites and Termite Control: by Charles A. Kofoid, S. F. Light. A. C. Horner, Merle Randall, W. B. Hermes, Earl E. Bowe and others. (A Report to the Termite Investigations Committee: Printed by the University of California Press, Berkeley, pp. 1—734. January, 1934.)

Till the appearance of this publication, the only monumental work on the Termite fauna of the world was the 'Les Termites' of the Swedish Entomologist E. Hegh. The present publication is a very valuable contribution to our knowledge of the termite world and is a report presented to the Termite Investigations

Committee of San Francisco, the object of the Committee being "to investigate the conditions as they exist in the region pertaining to termites, their action upon structures, the best means of protecting these structures against their attack, and to prepare progress reports as the work progresses."

The report in the words of Mr. A. A. Brown, Chairman of the Committee is "the result of co-operative enterprise. Its contributions of data, ideas, conclusions, and criticisms are in large part the results of the co-operation, on the one hand of men prominent in the large-scale production and utilization of wood, and, on the other, of scientific men, chiefly members of the faculty of the University of California at Berkeley, interested in specific phases of the subject." In addition to these, several engineering staff and principals of several corporations have given very valuable and lot of data as regards the extent, degree and nature of termite damage.

This report is in four parts. Part I consists of chapters 1 to 32 of which 1—10 chapters deal with the biological aspect of termites such as the general social organization of these insects; climatological factors that affect the occurence of termites; geographical distribution and factors that affect such distribution; the constitution and development of a termite colony; the external and internal anatomy; the histology of the digestive tract; the intestinal prototozoa; association of termites with fungi; and lastly a world view of termites which consists of distribution, classification with the characters of the Order and Families of this group of insects. Chapters 11 to 32 give an account of the termite fauna of North America, Hawaii, Mexico, West Indies, Canal Zone-Panama and the Philippine Islands; and in each case their economic significance is also dealt with.

The termites are classified into different kinds, according as their modes of life, such as the subterranean termites, dry-wood termites, damp-wood termites, and termites in relation to growing plants.

Some of the chief termites dealt with are (1) the subterranean termites under which come the Western Subterranean termite *Reticulitermes hesperus*; the barren lands subterranean termite *R. tibialis*; the desert subterranean termites of the genus *Amitermes* and several subterranean species of the genus *Reticulitermes*; (2) the dry-wood termites which consist of the common dry-wood termite *Kalotermes minor* and several other species of this genus as well as *Cryptotermes brevis* Walker and *C. cavifrons*; (3) the damp-wood termites of the genus *Zootermopsis* (formerly *Termopsis*) and the desert damp-wood termite *Paraneotermes simplicicornis*, and (4) termites in relation to growing plants of the genus *Reticulitermes*, *Heterotermes* and *Amitermes*.

The fauna of the different regions discussed are species of the genera *Coptotermes*, *Kalotermes*, *Cryptotermes*, *Reticulitermes*, *Amitermes*, *Heyerotermes*, *Microcerotermes*, *Nasutitermes*, *Macrotermes*, *Prorhinotermes* and *Termes*.

In all these cases their biology, distribution, description, identification and their economic significance as well as their nature of damage, distinguishing characters in several cases are accompanied by a key to the concerned species and genera.

Chapter 32 deals with a few wood-boring insects whose doings resemble those of termites. Some of the insects dealt with in this chapter are the larvae of *Prionus californicus* Mots.—the long-horned wood-boring beetles; Carpenter bees of the genus Xylocapa; the Carpenter Ants of the genus *Camponotus*; the powder-post beetles of the family *Anobiidae*, *Bostrichidae* and *Lyctidae*. At the end of this chapter methods of treatment against these insects are also given, such as keeping fresh and good timber away from old and infested ones, examining of sap-wood before utilising such wood and replacing such portions infested, kiln drying infested portions and swabbing with kerosene at frequent intervals etc.

Part II deals with Chemical Investigations which are directed along two lines as stated in the introduction itself viz.. (1) "Prevention of termite attack on cellulose containing substances; and (2) the elimination of existing termite investigations. Chapters 33—40 deal with these aspects of the problem.

Under preventive measures are included chemical and other preservatives applied to wood, effects of paint films, and lastly effects of ground treatments with poisons; and dust treatments and fumigation are dealt with under elimination of existing infestations.

Part III consists of chapters 41—45 which deal with termite resistivity of wood and building materials.

And lastly Part IV consisting of chapters 46—56 deals with prevention and repair of termite damage. Herein are discussed some general recommendations for the control of termite damage in general; methods of preventing damage by subterranean termites and methods of repairing damage by subterranean termites; treatment of telephone poles with preservatives and the results obtained therefrom etc. It also deals with legislative action, prevention of wood-decay in buildings and termites in relation to earthquake damage. In fact, it is this chapter that is most important and contains very valuable information as it deals with methods of control V. M.

Abstracts and Gleanings.

The Sugarcane Plant: (*A Study of Millable Cane and Sucrose Formation.*) The composition of a sugarcane crop and its influence on cane yield and juice quality were studied in March and September plantings of the H. 109 variety. A cane crop at any time was shown to consist of stalks of different ages and in different stages of vigour and maturity. Average yield and quality are naturally influenced by the relative proportion of these stalks at different ages.

Suckering appeared to be a continuous phenomenon in a field of sugarcane and influenced primarily by self-shading due to plant competition. Independently of season the number of suckers reaches a maximum between 4 and 5 month of age which is followed by a decline to a more or less stable number of about 3 stalks per foot for H. 109. Under the experimental conditions a crop of H. 109 consisted very largely, 80 to 100 per cent, of stalks germinating within 3 months after planting. March-planted cane appeared to be better suited to a long crop and September-planted cane to a short crop. The effect of tasseling and the time of last fertilization seemed to have an important bearing on crop yield. Excellent juices were obtained from both first and second-season cane in spite of a continuous application of 4 inches of irrigation per week up to harvest. There was no indication of deterioration of juice with age in those stalks that remained sound.

Millable cane could be divided as to quality into dry leaf, and green leaf, i.e., the part of the millable stalk where green leaves are still attached At any stage in plant development, the dry-leaf section appears to be more or less mature and beyond the reach of ordinary cultural treatments, whereas active accumulation of sucrose is still going on in the green-leaf section. The average juice of the whole stalk is a composite of these two sections and must be influenced greatly by the relative proportion of their juices by weight. The difference in the average quality of old cane and young cane may then be due primarily to the difference in the ratios of these two parts. It is suggested that maturity may more logically be considered as the shortening of the minimum of

the green-leaf section than as an arbitrary concentration of sucrose or glucose in the stalks

Other pertinent factors discussed include variations from stalks to stalk and with the same stalk, and effects of tasseling or side-shoots borer and mechanical injuries, shading, fertilization, and soil temperature. (*Exp. Stn. Record* Vol. 71 No. 6 pp, 769–770.)

Cytological Studies on the Peanut, Arachis.—*I, Chromosome Number & Morphology*). Counts at the University of Virginia showed the somatic chromosomes of several previously un-reported varieties and lines of *A. hypogaea* to number 40. In all forms examined one pair of chromosomes was conspicuously smaller than any of the others of the compliment, all the chromosones possessed median primary constrictions, and secondary constrictions were present. The small chromosomes varied in length from 0·8 M. to 1·3 M. the next in size from 1·2 M. to 1·7 M. and the largest from 1·9 M. to 2·7 M, depending upon the fixative and stain used. The haploid number of one bunch and two runner varieties of *A. hypogaea* was found to be twenty, irregular chromosomes associ ition was observed, and secondary association was present. There seemed as yet to be no cytological evidence to support Waldron's hypothesis of dual origin (E. S. R. 53., 53 p 236). Examination of 8 runner type and 8 bunch type strains of *A. hypogaea* did not reveal differences in chromosome number. (*Exp. Stn. Record*, Vol. 71, No. 6 pp. 758.)

Fundamental Concepts in Plant Research : This is a somewhat philosophical discussion of the relation of plants to their environment, in which the plants of any particular species are viewed as reflecting (1) the influence of the age-long adaptive struggle of their ancestors with the environmental complex under which they developed, and (2) immediate response in a species preserving direction to changes in their situation brought about by natural causes or through the efforts of man. The author argues for inclusion of these broader concepts in the search of workers in plant science for the reasons underlying the phenomena they are studying. (*Exp. Stn. Record*,. Vol 21, No. 6 p. 757)

Mineral Nutrition of Plant. Recent researches carried out on the fruit trees of temperate regions have clearly demonstrated that the correct nutrition of crop plants is a highly complex problem, and special knowledge and methods are necessary for the correct diagnosis of manurial requirements. It is now recognised that for each plant species there exists a balanced nutrient solution from which normal absorption occurs and greatest growth and yield result. A departure from this balance, either through deficiency or excess, produces a disturbance of absorption relations which may exert definitely harmful effects on plant growth.

In these days of low prices for the produce of tropical crops, the use of artificial manures can only be possible if the maximum benefit is derived from the added manure. The elements nitrogen, phosphorous and potassium are commonly present in the soil in inadequate or unbalanced amounts, and one or more of these three elements may have to be applied in the form of manures if adequate crops yields are to be obtained. The individual growth effects of each one of these elements does not, however depend solely on its gross deficiency or excess, the effects very considerably depending on the proportion of the other elements present in the soil solution. From a practical point of view, therefore, full benefit cannot be expected from the application to the soil of haphazard or arbitrary manurial mixtures. For instance, it is a common practice, when using artificials, to apply to the soil a "complete" manure containing nitrogen, phosphorus and potassium in about equal proportions, irrespective of the requirements of the soil or crop in question. In certain cases, the presence of one or more of these expensive ingredients may be wasteful or even harmful since they

may be already present in the soil in adequate proportion, and the added quantities in the manure may give rise to an unbalanced nutrient supply to the plant. The application of manurial substances should be made in particular and specific ratios, depending upon the particular requirements of the soil and plant as shown by soil analysis, field manurial trials, pot test and chemical analysis of plant material.

For the purpose of estimating manurial requirements the simple determination of nutrient deficiencies of a soil is not alone sufficient. Excess as well as deficiency of a particular element may result in decreased growth and yields. In this connection, there appears to be a particularly delicate balance between the two elements, pottassium and nitrogen. While neither element will give its full beneficial effect without adequate supplies of the other, yet the presence of either in excess usually depresses growth and yields also. On the other hand, phosphate may be present and may be absorbed in considerable excess without exerting noticeably harmful effects. (*Tropical Agriculture*, Vol. 12, Part 1, 1935.)

Fruit Growers and Distributors' Organisation in other Countries—I. *The United Fruit Company, England*:— The association is almost entirely devoted to the marketing of bananas in the United Kingdom. It is an illustration of one of the most complete fruit control and marketing organizations. Though of comparatively recent organization, it practically speaking controls the whole banana industry of the United Kingdom and is responsible for the supply of the major part of the 16,000,000 cwt of bananas annually imported into this country from the West Indies and adjoining South American mainland. The majority of members are big growers who supplement their supplies to the marketing organization by buying up the fruit of the independent growers dealing with the standard types of banana and growing and handling them in a prescribed fashion. This company collects, grades and ships the fruits in vessels, belonging to Messrs. Elder and Fyffes., specially built for the trade. The association owns 83 per cent of the shipping company, so that it may be said to have its own fleet. They practically hold a monopoly of the United Kingdom market and fix the wholesale prices.

The California Fruit Growers' Exchange:— This is a very highly organised and comprehensive body. The organisation directs the technical production, collects, grades, packs and markets the produce of 10,000 growers. Apart from its percentage on an enormous volume of marketed fruit, the annual subscription fund is over a lakh and a half a year. The lowest tire of this organization consists of some two hundred collecting and packing units each with its associated society of growers operating in different parts of California which in itself is not bigger than the United Provinces. These are affiliated to District Exchanges which are in turn centred in a main exchange with an elaborate central sales organization. The whole system rests on a system of contracts between the growers and the packing unit and between the units and the central body. These contracts have been made binding by litigation. This exchange only handles citrus fruits and markets 70 per cent of the Californian crop. The oranges go to many markets, the chief being Eastern United Kingdom. The whole of the United Kingdom fruit is consigned to one individual who represents the exchange and who disposes of the fruit through existing trade channels. The broker is only interested in the function of selling the fruit. The chief features are—

a) the development of a pooling system, so that the produce of the individual is merged in the total crop;

b) exclusion of finance by brokers,

c) the use of one established broker in each of their importing markets,

d) the concentration of distribution in as far as the United Kingdom is concerned in the hands of one man who selects the market and the salesman. (*U. P. Bull. No. 11*—Fruit Ser. 1934. pp. 3 & 4.)

Irrigation of Rice Fields in the Tropics. *Optimum Height of Water.* At the time of transplanting 1½" to 2" of water is maintained to encourage the plants to take root, and to reduce damages by crabs and the same level is maintained for 4 or 5 days subsequently. Then it is gradually raised to 4" till about the beginning of tillering. Good growth and tillering are encouraged by draining the water in the field 10 to 15 days after the crop has established and reducing the level to 1½" to 2". It has been found that tillers do not develop if the plant is too deeply submerged. After tillers have been established the level of water may gradually be increased upto 5" to 7" and the greater depth of water at the time of flowering and grain setting has been found to be beneficial to higher yield. The field can be drained and a lower level of water may be maintained after the grains are well developed. Complete draining and hardening the soil should not be done if paddy crop is again to succeed after a short interval. The high yield obtained in Italy are mainly attributed to a steady admission of fresh water by a slight current and draining the land completely 2 or 3 times for several days during the period of growth.

Defects of excessive drainage and drought. If a heavy clay field is drained soon after transplanting the root development is arrested and the crop withers if drying is prolonged for a week and more developing cracks on the surface. The yield is adversely affected if the water runs out continuously. It has been noted that paddy plants are not affected by drought during their vegetative growth just before the crop runs to shot blade. But at the time of flowering and grain formation greatest harm results from shortage of water. Ears do not come out of the shot blade easily. The flowering is irregular and retarded and many grains do not develop. (*Original in French* by M. R. Dumont *extracted in the International Review of Agriculture (Rome)*—Vol. 25, October, 1934, Page 442).

Weather Review (FEBRUARY—1935)

During the month six western disturbances affected the north. The first one which appeared on the 1st caused nearly general rain in Baluchistan, North Western Frontier Provinces, Kashmir, Sind and Orissa and passed away eastwards on the 5th, after causing rains also in North Bengal and Assam. A second disturbance appeared on the 4th, caused rain in Baluchistan and a few showers in Kashmir. the Kauman hills, North Bengal and Assam and passed away eastwards on the 7th. The third disturbance affected Baluchistan on the 9th and moving eastwards caused widespread rain in Baluchistan, North Western Frontier Provinces and Kashmir and developed into a low pressure area over the Punjab on the 15th. The low pressure area moved away eastwards on the 18th after causing general rain in United Provinces, Bihar, Bengal and Assam. Three more western disturbances affected the extreme north on the 17th, 22nd and 24th, causing nearly general rain in North Western Frontier Provinces, Kashmir, and the Punjab hills.

Weather was dry over the rest of the country except for occasional scattered falls in Malabar and North Hyderabad.

Earth-quake shocks of slight intensity were recorded by the Bombay Seismographs on the 3rd and 4th February with origin about 1190 and 1310 miles away respectively. A third shock of great intensity was recorded on the 23rd with its origin about 5860 miles away from Bombay.

Rainfall was in slight defect throughout the Presidency.

RAINFALL DATA

Division	Station	Actual for month	Departure from normal	Total since January 1st	Division	Station	Actual for month	Departure from normal	Total since January 1st
Circars	Gopalpore	0 0	−0·7	0·0	South	Negapatam	0·1	−0·6	5·1
	Berhampore *	0·0	−2·1	0·0		Aduthurai *	0·0	−0·3	3·7
	Calingapatam	0·0	−0·5	0·1		Madura	0·0	−0·3	0·7
	Vizagapatam	0·0	−0·8	0·0		Pamban	0·3	−0·4	4·0
	Anakapalli *	0·0	0·0	0 0		Koilpatti *	0·0	−0·7	0·8
	Samalkota *	0·0	−0·3	0·0		Palamkottah	0·3	−0·5	2·1
	Maruteru *	0·0	−0·1	0 0					
	Cocanada	0·0	−0·2	0·3					
	Masulipatam	0·0	−0·0	0·1	West	Trivandrum	1·1	+0·6	2·8
	Guntur *	0·0	0·0	0·0	Coast	Cochin	0·2	−0·6	0·7
						Calicut	0·0	−0·1	0·6
Ceded	Kurnool	0·0	−0·1	0·1		Pattambi *	0·0	−0·7	0·0
Dists.	Nandyal *	0 0	−0·2	0·0		Taliparamba *	0·0	0·0	0·0
	Hagari *	0·0	−0·3	0·2		Kasargode *	0·0	−0·3	0·3
	Bellary	0·0	−0·2	0·1		Nileshwar *	0·0	−0·2	0·0
	Anantapur	0·0		0 0		Mangalore	0·0	−0·1	0·0
	Cuddapah	0·0	−0·1	0·2					
Carnatic	Nellore	0·0	−0·1	1·2	Mysore	Chitaldrug	0·0	−0·1	0·4
	Madras	0 0	−0·3	0·6	and	Bangalore	0·0	−0·2	0·1
	Palur *	0·0	−0·3	4·0	Coorg	Mysore	0·0	−0·2	0·0
	Palakuppam *	0·0	−0·9	1·9		Mercara	0·0	−0·2	0·7
	Cuddalore	0 2	−0·8	2·9					
Central	Vellore	0·0	−0·3	1·5	Hills.	Kodaikanal	0·4	−1·0	2·7
	Hosur cattle farm *	0·0	−0·4	0·3		Coonoor	0·0		2·6
	Salem	0·0	−0·3	0·9		Ootacamund *	0·0	−0·6	0·2
	Coimbatore	0·1	−0·2	0·5		Nanjanad *	0·0	−0·5	0·2
	Coimbatore Res. Inst. *	0·2	−0·3	0·4					
	Trichinopoly	0·0	−0·6	0·8					

*Meteorological Stations of the Agricultural Department.

Weather Report for the Research Institute Observatory.

Report No. 2/35.

Absolute Maximum in shade	...	95·0°F.
Absolute Minimum in shade	...	59·8°F.
Mean Maximum in shade	...	90·7°F.
Departure from normal	...	+ 0·1°F.
Mean Minimum in shade	...	66·1°F.
Departure from normal	...	+ 0·6°F.
Total Rainfall	...	0·15″
Departure from normal	...	−0 25″
Heaviest fall in 24 hours	...	0·15″
Total number of rainy days	...	1
Mean daily wind velocity	...	3·0 m.p.h.
Mean humidity at 8 hrs.	...	71·5%
Departure from normal	...	0·0%
Total hours of bright Sunshine	...	269·9
Mean daily hours of bright Sunshine	...	9·6

General Summary.

Weather was dry almost throughout the month. Meteorological conditions were normal except for a slight defect in rainfall.

A. S. R. & A. S.

College News and Notes.

Students' Corner. With the University examinations fast approaching, there was a lull in athletic activities but more than passing interest was evinced in cricket practice, due chiefly to the presence at Coimbatore, of the Presidency Cricketeer Mr. C. Ramasamy, Assistant Director of Agriculture in charge of the III Circle. The Students' Club including him as one of the team, visited Ootacamund on the 2nd and 3rd of March and played a match with the Ooty Combined Cricket Club. A very exciting match ended in a remarkable tie, each side scoring 113 runs. For the college, Messrs. C. Ramasamy, H. Ramanatha Rao and U. Narasinga Rao scored 35, 30 and 19 runs respectively, while of the bowlers, Lakshmanan was the most successful taking 6 wickets for 36 runs.

The Students' Club-Day came off on the 23rd of February and as usual there was a large number of entries for the fancy dress competition, the judges whose task was no light one, finally awarding the prizes, in order to (1) Beggar, (K. Jayaram), (2) Rolling Sanyasin (Kanniah, K.), (3) Kabooli (Hanumantha Rao, C.), (4) Monkey-trainer (Ali Hyder), (5) Prodigal Son (Samuel Joshua) and (6) Butler (Arunachalam, C.). After the reading of the annual reports by the Secretaries, Messrs. K. R. Sundaresan and A. Marie Kolandai, Mrs. M. Damodhra Kini, gave away the prizes and cups to the various prize-winners for the competition held in connection with the Club-Day after which, a very interesting entertainment was gone through, including the reading of the College Rag of the year by Mr. U. Narasinga Rao. Mr. M. Damodhra Kini, Retired Principal of the Government College, Coimbatore, presided on the occasion.

A very successful year of activities concluded with the extremely interesting valedictory address of the Students' Club delivered by Mr T. K. Doraisamy Iyer, Principal, Government College, the subject of the lecture being 'World Recovery and Agricultural Rehabilitation'.

Lectures. Rao Bahadur M. R. Ramasamy Sivan, Retired Principal, delivered the Travancore-Curzon endowment university lectures on the 'Manurial Problem of India' on 18th, 19th and 20th February.

The Association of Economic Biologists. Under the auspices of the association, Dr. F. J. Shaw, delivered a lecture on 'Chance and Error' which was largely attended.

Visitors. The Zamindar of Kangundi an honorary visitor to the College visited the College and estate on 18th and 19th March 1935.

Demonstrators' Deputation. A number of Demonstrators from the various circles visited the estate during February and March having been deputed to study under the Government Agricultural Chemist, the method of preparation of the activated charcoal used in the manufacture of cream jaggery.

Bee-keeping and Jaggery-making Short Courses. Students were selected for training in the above subjects and were under training at the College during February.

News in Brief.

First Meeting of the Board of Agriculture. Crops and Soils Wing. The Board of Agriculture which met at Pusa in 1929 considered the future constitution of the Board and decided that it should consist of two wings—one for Soils and Crops and the other for Animal Husbandry and Animal Health. The first meeting of Animal Husbandry Wing according to the revised constitution met in New Delhi

from the 20th to 23rd February 1935. The first meeting of the crops and soils wing met in Delhi under the Chairmanship of Sir T. Vijayaraghavachari, Vice Chairman, Imperial Council of Agricultural Research from the 25th February to 2nd March 1935. The Board as per the new constitution has been enlarged to include non-official representatives from the Provinces and representation from the Inter University Board.

The following is the agenda for the meeting.

1. The planning, technique and interpretation of field experiments and the technique of cultivation.
2. Soil surveys and soil analyses.
3. Soil Amelioration.
4. The maintenance of soil fertility with special reference to the maintenance of the nitrogen level by green manures and composts.
5. A review of the organisations existing for agricultural propaganda and other extension work.
6. The water requirements of crops.
7. To consider whether a Bureau of Plant introduction should be established in India, for the controlled introduction and testing of new crops and for the exploration of promising regions in the search for new species.
8. To consider (a) what further measures should be taken for the improvement of the Indian fruit industry; (b) the need for a central fruit bureau and (c) the prospects of fruit-canning in India.
9. Agricultural Marketing.
10. The influence of cheap Hydro-electric power on agricultural development.

Subjects 1 to 6 were referred to special committees of the Board in accordance with the usual practice and subjects 7 to 10 were dealt with by the full Board only.

As mentioned in the last number of the Journal, Madras was represented at the Board by the following persons.

Officials. Messrs. S. V. Ramamoorthy, Director of Agriculture, Madras, K. Ramiah, Paddy Specialist and P. V. Ramiah, Government Agricultural Chemist.

Non-officials. Dewan Bahadur T. Raghaviah. Rao Bahadur C. Tadulingam. Mr. K M. Singaravelu Mudaliar—Representative of the Co-operative Movement. Rao Bahadur M. R. Ramaswami Sivan—Elected by the Inter University Board.

Mr. A. P. Cliff, Dy. Director of Agriculture, Bihar and Orissa and Mr. K. Ramiah, Paddy Specialist, Madras acted as Technical Secretaries to the Board.

The agenda had been circulated to the members of the Board as well as to the Agricultural Officers in the Provinces and there had been received a large number of notes prepared by the various people on each of the subjects. The Sub-Committees formed for each of these subjects dealt with these notes and brought forward a comprehensive report for discussion and adoption by the General Board. Subject No. 5 dealing with propaganda had been entrusted to a big committee consisting of most of the Directors of Agriculture and the non-officials with the President himself as its Chairman. This committee had made some practical and valuable recommendations with regard to improving the propaganda.

Details of the proceedings of the Board will appear later.

Imperial Council of Agricultural Research. The Advisory Council met in Delhi between 18th to 23rd of February 1935. As usual a number of Sub-committees were first appointed to examine and report on the various schemes that had

been received from the Provinces for financial help. These reports were then considered by the General Body. Among the new schemes approved by the Advisory Council at this session might be mentioned, (1) Application from the Government of Bombay for a scheme of research in Goat Breeding in the Bombay Presidency; (2) Application from Mr. J. J. Devalois of the Agricultural Institute, Katpadi for a scheme of research in Goat Breeding; (3) Opening of a Central Tobacco Research Station at Guntur in the Madras Presidency; (4) A scheme from United Provinces to undertake cotton seed crushing and supply of decorticated cake for educative propaganda; (5) A scheme from Travancore State to investigate the 'root disease' of the cocoanut palm; and (6) Application from the Central Provinces for a scheme of research work on *pan* cultivation.

The Advisory Council also approved of the extensions to the Statistical Section attached to the Imperial Council of Agricultural Research and the Agricultural Moteorology Section at Poona. The annual reports of the several rice research schemes financed by the Imperial Council of Agricultural Research were first examined by a special committee and its report was later adopted by the general council.

Crop & Trade Reports.

Paddy Crop (Madras)—1934-1935. *Third or Final Report.* The average of the areas under paddy in the Madras Presidency during the five years ending 1932-'33 has represented 13·3 per cent. of the total area under paddy in India.

2. The area sown with paddy in 1934-35 is estimated at 10,828,000 acres as against 11,576,000 acres for the corresponding period of last year and the finally recorded area of 11,703,788 acres in 1933-34. The present estimate falls short of the final area by about 7·5 per cent. and the area of 11,381,660 acres in an average year by 4·9 per cent.

3. 1,117,000 acres have been reported as sown since the last December forecast was issued. The extent so sown was large in West Godavari, Nellore (124,000 acres), South Arcot (115,000 acres), Chittoor, North Arcot, Madura, Ramnad (150,000 acres) and Tinnevelly (105,000 acres). The area sown in December and January was greater than that sown in the corresponding period of last year by 32,000 acres or by about 3 per cent.

The area under second crop paddy is expected to be generally below normal.

4. The harvest of paddy is in progress.

The yield is expected to be normal in Ganjam, Vizagapatam Kistna, Guntur. Kurnool, Cuddapah and South Kanara and below normal in the other districts mainly due to adverse seasonal conditions. The yield was the lowest in Anantapur (77 per cent.). The seasonal factor for the Presidency works out to 95 per cent. of the average as against 97 per cent. in the season and crop report of last year. On this basis, the yield works out to 96,114,000 cwt. of cleaned rice. This represents a decrease of 9·6 per cent. when compared with the estimate of 106,289.000 cwt. in the season and crop report of last year. The yield in an average year is estimated at 107,776,000 cwt.

5. The wholesale price of paddy per imperial maund of 82-2/7 lb. as reported from important markets towards the close of January 1935 was Rs. 3 in Madura, Rs. 2—14—0 in Nellore, Rs. 2-10-0 in Cuddapah, Salem and Tinnevelly, Rs. 2-8-0 in Nandyal, Rs. 2—6—0 in Trichinopoly, Rs. 2—5—0 in Bezwada, Rs. 1—8—0 in Negapatam and ranged from Rs. 1—13—0 to Rs. 2—3—0 in the other markets. When compared with the prices reported in the previous month, these prices are

stationary in Berhampur, Vizagapatam, Vizianagram, Bezwada, Guntur, Trichinopoly and Tinnevelly, they have risen by about 4 per cent. in Cuddapah and Madura and are lower by 21 per cent. in Negapatam, 16 per cent. in Vellore, 14 per cent in Cuddapah, 13 per cent. in Vizianagram, 10 per cent. in Kumbakonam, 9 per cent. in Rajahmundry, 7 per cent. in Salem and 3 to 5 per cent. in the other markets.

Departmental Notifications.

Postings and Transfers. Messrs. K. Bhushanam, B. Sc. (Ag.), S. Sitarama Raju, B. Sc. (Ag.), T. Venkataramana Reddi, B.Sc. (Ag.), D. Rajabhushanam, B.A. (Hons.), C. H. Venkatachalam, B. Sc. (Ag), M. Bhavani Shankar Rao, B. Sc. (Ag), and M. L Balasundaram, B, Sc. (Ag.) will continue to officiate as Upper Subordinates. Mr. Bennet P. Masilamani, B. Sc. (Ag.) (Assistant in Chemistry). Mr. Edwin Amirtha Raj, B. Sc. (Ag.) (Agricultural section) Mr. M Subrahmania Chetty, B.Sc. (Ag) (Assistant in Cotton section) and Mr. B. Adishesa Reddi, B. Sc. (Ag.) (Temporary Assistant in Chemistry) are posted as Upper Subordinates from 20th March 1935 and will be considered to be on probation. Mr. P. Parthasarathy, B. Sc. (Ag.) is reappointed as Upper Subordinate.

Transfers. Mr. V. G Dhanakoti Raju Garu, A. D. Sattur to officiate as Headmaster, Agricultural Middle School, Usilampatti; Mr. J. S. C. Antony from Agricultural School, Usilampatti to A. R. S. Koilpatti; Mr. K. Saptharishi, A. D., VI Circle and Mr. N. G. Narayanan, Assistant in Cotton, to be Temporary Assistants in the Madras Phempheres and Physiological scheme; M. C. Menon from A. R. S. Koilpatti to L. R. S. Hosur; Mr. S. Suryanarayana to be A. D., Coconada on termination of his special duty in II Circle; Mr. N. Ramadoss, A. D., Coconada to the Vizagapatam Division; Mr. M. Kalimuthu, A. D., Aruppukottai, to be A. D., Tenkasi; Mr. S. P. Fernando, A. A. D. to Aruppukottai on the expiry of eradication of Pulichai work; Mr. L. Sankarakumara Pillai, A. D., Tinnevelly to Tirupathur; Mr. G. Venkatakrishna Iyer, A. D., Tirumangalam to Tinnevelly on relief by Mr. S. V. Ramachandran on special duty; Mr. A. K. Ganesha Iyer, A. D., Nilakottai to Ramnad taluk to start district work there; Mr, K. Jaganatha Rao on the expiry of his leave to be A. D., Anantapur; Mr. M. Krishnaswami, A.A.D., Anantapur to be A. A. D., Siruguppa; Mr. A. Chidambaram Pillai, A. D., Omalur to Salem. Mr. T. G. Ananta Rama Iyer from Central Farm, Coimbatore to L R.S. Hosur and Mr. V. Karunakaran Nair, L. R. S., Hosur to Central Farm, Coimbatore.

Leave. Mr. V. S. Narayanaswami Iyer, Headmaster, Agricultural School, Usilampatti, l a. p. for 4 months from 24th April 1935, with permission to prefix Easter; Mr. P. K. Parameswara Menon, A. D., Erode on l a. p. for 2 months from 8—4—35; Mr. P. R. Subrahmania Iyer, Farm Superintendent, Agricultural School, Usilampatti, extension of l. a. p. for one month and 9 days from 22nd February 1935; Mr. G. Sitarama Raju extension of l. a. p. on M. C. for 4 months from 5—3—35: Mr. S. Varadarajulu Naidu, A. D. in charge of van Unit No. 1, l. a. p. for 2 months and Mr. A. Ramaswami Iyer, A. D., Cuddalore extension of l. a. p. by 6 weeks from 23—2—35.

Gazetted Notifications. Mr. G. Ganapathy Iyer and Mr. M. Suryanarayana to officiate as Assistant Agricultural Chemists, and Messrs. K. W. Chakrapani Marar, S. N. Venkataramanan and M. P. Kunhikutty to officiate as Assistant Temporary Marketing Officers.